

SEPTEMBER, 1959



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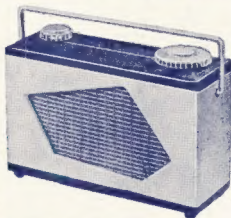
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3055	5205	6540	8014
3140	5385	6547.9	8015
3270	5435	6547.92	8016
3280	5450	6550	8018
3305	5530	6561.111	8020
3320	5535	6583	8021
3432.5	5551.55	6625	8025
3450	5635	6650	8025.5
3460	5680	6780	8026.5
3467	5706.67	6815	8050
3731	5725	6850	8075
3840	5740.000	6900	8100
3885	5744.444	7004	8111
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4055	5775	7174	8200
4096.6	5806.7	7197.1	8220
4130	5840.000	7198	8225
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4255	5850	7300	8275
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4280	5875	7362	8290
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EDITORIAL



NATIONAL FIELD DAY

It is inexplicable why the National Field Day Contest has never become very popular in Australia. The Field Day event in the U.S.A. and in Britain appears to be one of the most popular Amateur events of the year. Where does our own N.F.D. Contest fall down? Our Federal Contest Committee have done their utmost to make this event popular but with no apparent effect. Are the rules too restrictive? Is the effort of gathering your gear together and "going bush" for the week-end too great? Prizes have been offered, mobile participation included, DX working incorporated and even large bonus points offered for v.h.f. contacts—all to no avail. The entries still do not rise above the odd dozen or so, who in the main seem to be the same participants year after year.

This Contest has now reached the stage when it must be dropped from our Calendar of Contests or something done to increase its popularity. The importance of this contest as seen at the time of its inauguration was to encourage Amateurs everywhere in Australia to build and experiment with small portable equipment so that in the event of an emergency a large number of portable stations would be available at a few minutes notice to pack up and operate anywhere on battery or emergency power. This concept has not changed—in fact, it is probably more important now than it was originally. In addition, with the advent of the transistor, the task of making small highly-portable equipment is an easier one.

It is certain that most Amateurs today will agree that one of their few reasons for existence, from a civic or public utility point of view,

is in their oft-stated speed of getting a line of communication established between two points and being able to quickly pack up and move to another location. Is this statement really true? It would seem from the lack of interest in a contest designed to encourage this type of operation, that it is not. There is only one way of disputing this statement—let us hear your call on the air at the next Field Day.

If, on the other hand, it is something in the rules of the contest which prevents a lack of interest on your part, there is a ready reply to that—write to your Division explaining where the rules fall down, and why you don't intend to enter. Your constructive suggestions are the only answer to allegations of laziness, poor rules or other reasons. The matter appears to be in your hands—this contest takes a lot of time to organise and if it is not required, why not—the Contest Committee will be only too pleased to devote their time and energies to something else.

Your Federal Executive, however, does think a National Field Day Contest is important, for therein may lie our future "raison d'être" or one of the few reasons there will be offered for the existence of the Amateur Service in the world of growing commercialism in Communications. Make a united effort now to prove this contest is worthwhile, and to create the same popularity that exists with the Remembrance Day Contest. The amended rules proposed by the new Federal Contest Committee are now with your Divisions for comment—now is the time for you to have your say in this matter—do so without delay.

(Now turn to Page 12 for Amended Rules.)

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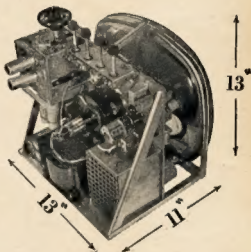
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Tropospheric Propagation at V.H.F.

PART TWO

ALAN ELLIOTT,* VK3AEL

IN the first part of this article an outline of the conditions necessary for long distance tropospheric propagation and the meteorological events which could produce them were given. Now let us examine the weather maps and radiosonde graphs of the atmosphere on some occasions when the two metre band was open. The graphs have been traced from soundings made from Laverton, near Melbourne, during the early afternoon of the days indicated. The water vapour scale is not shown because it varies with altitude thus requiring specially ruled paper; however, the readings of mixing ratio in grams per kilogram are shown at significant points. The graphs should be interpreted with some caution be-



Fig 5a 23 Feb. 1956

and 5,600 feet, an average of 2.5°C. per 100 feet. A small humidity lapse was present also. Some of the charts indicated humidity lapse only. The observations apply to two metres, and are limited to south-eastern Australia where I have first-hand knowledge of conditions.

17th to 18th February, 1957

A weather map which is typical of the chart during widespread two metre DX is given in Fig. 4a. A high pressure ridge existed over Tasmania with the trailing edge spreading out very extensively over South and Central Australia. The low pressure off the eastern coast was a cyclone which moved southwards and retarded the easterly progress of the high, thus favouring subsidence. The evenings of the 17th and 18th February, 1957, will long be remembered by the v.h.f. gang in the area covered by south-eastern South Australia, Victoria and Northern Tasmania where signals were moderately strong to very strong in all directions. On the 18th, contacts were made between Ouyen in north-west Victoria and Launceston on the north coast of Tasmania over a distance of 512 miles. Melbourne television stations were received over a wide area. The weather was fine with some temperatures in the nineties.

The radiosonde chart, Fig. 4b, gives the story of the atmosphere in the afternoon of the 18th. There was a drop in mixing ratio from 9.0 to 1.9 gram per kg. between 1500 and 3300 feet, averaging 0.4 g./kg. per 100 feet. Over the highest 300 feet of this layer there

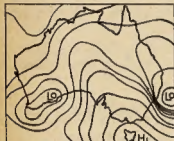
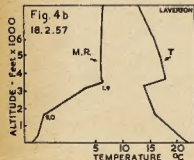


Fig 4a 18 Feb. 1957

cause of possible instrument errors, the comparatively small number of points plotted and the fact that the soundings were made at the time of day when the band usually is at its lowest ebb. On the original charts the levels were shown in millibars; these have been converted approximately into feet. The minimum requirements for super-refraction are usually quoted as + 2.8°C. per 100 feet rise for temperature or — 0.5 gram per kg. per 100 feet for water vapour content.



It was noted during the examination of scores of radiosonde charts of "good" days that on very few occasions was the temperature inversion alone great enough to cause super-refraction. One such day was 12th February, 1956, when there was a rise of temperature from 2.8°C. to 11.5°C. between 5,300

was a temperature rise of 4°C., i.e. 1.3°C. per 100 feet, giving a total gradient about 25% more than the minimum required. Also, as signals improved somewhat during the evening, surface cooling probably was an additional factor.

23rd February, 1956

A brief opening across Bass Strait followed shortly after a mild cool change without rain on 23rd February, 1956. The radiosonde chart, Fig. 5b, is interesting. There is a sharp temperature rise of 9°C. from 2,400 to 3,000 feet, i.e. 1.5°C. per 100 feet, but the effect of this inversion was more than cancelled by an increase of mixing ratio of 0.4 g./kg. in the same layer.

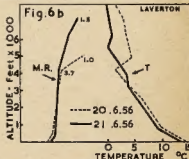


Fig 6a 21 June 1956

Thus at 3,000 feet the conditions were worse than normal. From 3,000 to 3,700 feet the mixing ratio decreased by about 0.45 g./kg. per 100 feet, the total refraction up to 3,700 feet was about one-third less than necessary. When the contacts were made several hours later there must have been an alteration in the ratio of positive and negative factors.

20th to 22nd June, 1956

Wintertime DX. During this period signals at night were strong and steady over a large part of Victoria, particularly west of Melbourne. The weather



map shows a high pressure area which moved slowly eastwards during this period bringing fine sunny days and calm cold cloud-less nights with widespread frosts and some fogs, the surface conditions frequently associated

(Continued on Page 11)

* 31 Fenton Street, Ascot Vale, Vic.

H.T. Control Circuit

BY K. B. POUNSETT,* VK2AQJ

THE control circuit used at this station kills several birds with the one stone. It provides:—

1. Protection for the rectifiers.
2. Slow charge rate for filter capacitors.
3. Overload protection.
4. Indicator when h.t. is on.

The operation is as follows: Closing S4, after rectifiers have time to warm up, places h.t. at the h.t. output terminal. Current through the 50K bleeder charges the 100 μ F. capacitor and then after a short delay closes the relay Ry. The relay should be one chosen to operate at the bleeder current. The one in use by me is a disposals one and closes on about 10 mA.

* Flat 22, Seifert Centre, Lowe St., Queensbeyan, N.S.W.

The short delay allows the filter capacitors to charge slowly due to the 1,000 ohm wire-wound resistor. When the relay operates, the contacts (S2) short this resistor. At the same time contacts S1 close the transformer primary circuit, locking up the system.

Release of S4 now does not effect the circuit and contacts S3 complete the indicator circuit, showing that the high voltage supply is on.

A short in the h.t. circuit causes loss of voltage and subsequent relay hold-in current. The relay drops out and S4 must again be manually operated to obtain h.t. Thus over-load protection is achieved.

Some eye-brows may be raised at the lack of chokes in this circuit, however this is standard practise in s.s.b. transmitter power supplies and the regulation is excellent.

VICTORIAN DIVISION W.I.A. ANNUAL STATE CONVENTION

at STAWELL

**SATURDAY AND SUNDAY,
3rd and 4th OCTOBER, 1959**

This coincides with the Flower Show at Halls Gap and opportunity will be given for interested members to visit this show. Activities will include transmitter and Fox Hunts on the Sunday. A Picnic Lunch will be held at Halls Gap on Sunday; bring your own lunch.

Agenda items must be with the Secretary of the Division by 14th September. Contact Bill Kinsella, 3AKW, re accommodation; forward to him £1 deposit.

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HINTS AND KINKS

6BE6 PREAMPLIFIER FOR BOTH HI- AND LO-Z MICROPHONES

Preamplifiers constructed here in the past have always employed either two high-gain tubes of a dual triode in order that both crystal and dynamic (low-output type) microphones could be used.

Recently, while working out design details for a completely new amplifier, the thought occurred that one of the popular r.f. mixer tubes might operate satisfactorily in a single-tube triple-purpose circuit having provision for both xial and dynamic-mike input and, at the same time, ability to serve as the mixer.

To test this theory, a type 6BE6 pentagrid converter tube was tested in the circuit shown as Fig. 1. After setting on the component values listed, the arrangement actually exceeded my fondest hopes. By connecting the dynamic microphone transformer to grid No. 1 of the tube, and the crystal mike to grid No. 3, not only did a rather neat mixer result, but the over-all gain of the amplifier remained essentially con-

stant regardless of which microphone was used. Apparently, the difference of approximately 20 db. in gain that the No. 1 grid arrangement has over the grid No. 3 circuit compensates for the difference in microphone output levels.

It is reasonably certain that the idea is not completely new, but it is one that I have never seen in print. Perhaps the circuit won't find too much application in Ham band equipment, but it may appeal to Amateurs interested in hi-fi, recording, etc.

—F. L. Mason, KHSOR, "QST" Jan. '58.

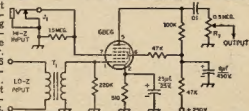


FIG. 1.—KHSOR uses this preamplifier-mixer circuit with both crystal and dynamic microphones. R1 is the gain control for the amplifier stages following the 6BE6. T1 is a dynamic microphone-to-grid transformer. All resistors except R1 are 1/2 watt composition. Capacitors marked with polarity are electrolytic.

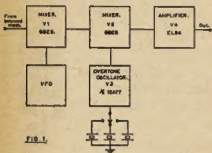
SIMPLE SIDEBAND*

PARTS NINE AND TEN

**AN ALL BAND HETERODYNE UNIT
SUITABLE FOR FILTER OR
PHASING RIGS**

I have long been of the opinion that the modern tendency to throw tubes into a rig quite regardless of cost or complexity is an attitude to be condemned and one of my first acts on receiving a circuit that interests me is to go over it and see if it can be simplified. Yet, I am going to discuss an all band heterodyne unit that itself uses one more tube than the excellent, yet simple, unit described last month. There are times when, if you would have "frills," you must pay for them!

Although last month's system is perhaps one of the most widely used systems in the world of Ham Radio (when used in conjunction with the phasing method of s.s.b. production) it does have one or two disadvantages. I list these as follows:



The need to multiply the v.f.o. frequency for 40, 15 and 10 metre operation also doubles the v.f.o. frequency instability. A ten cycle drift in a certain period may well be a 30 cycle drift on another band. This is perhaps the major disadvantage.

The tuning rate or kc. per revolution of the v.f.o. knob will vary from band to band.

The required frequency coverage is quite large (up to two megacycles if

* Reprinted from "Break-In," Jan., Feb., '30.

the whole of the 10 metre band is to be covered).

Band-changing inverts the sideband depending whether the oscillator is on the low or the high side of the signal.

In favour of the system shown in the block diagram of Fig. 1 and the circuit diagram of Fig. 2 are the following:

Stability of the output signal is that of the v.f.o. for all bands.

The tuning rate is constant and may cover roughly 500 kc. (or 1 megacycle if you would cover the 10 metre band in only two "swipes").

Suitable for filter or phasing type rigs.

It also has disadvantages. These are:
Requires several crystals and more components.

Forty metres will have the sideband inverted. (Lower sideband will become the upper and vice versa.)

The choice is yours. My money is on the latter system and is in fact used at this station.

Describing the System

V1, the first mixer, may be identical with last month's and the v.f.o. may be conventional—perhaps an ARCS conversion. ("QST", March 1954.) In V1 the v.f.o. is mixed with the s.s.b. signal from the balanced modulators and the output, which is in the range of 3.5 to 4 mcs. (may be extended to 4.5 mcs. if you would cover the 10 metre band in two "swipes") is fed to the second mixer V2. On 80 metres V2 acts as an amplifier and the input to V2 is the 4.5 to 4.4 mcs. tone fed with resistance to reduce its output comparable with that obtained on other bands. The EL84 is an ordinary amplifier operating in Class A.

C1 and C2 may be fixed condensers and the coils slug tuned and also stagger-tuned to give a more or less even response across the band. Alternatively, small trimmers may be wired across the condensers C1 and C2, repeaked when large excursions in frequency are

LESTER EARNSHAW, ZL1AAX

made. As a.s.b. is becoming more popular so it is tending to move away from the spots at the high frequency end of the bands, thus the need to use the trimmer will grow greater. In my own case I have a trimmer across C2 only.

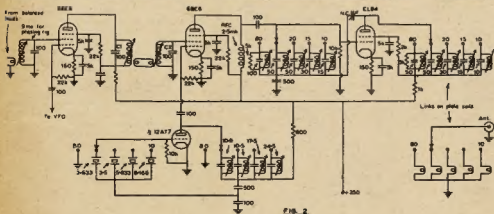
In V2, the second mixer, the output from an overtone crystal oscillator is mixed with the 80 metre signal and converted to the required band exactly as is done in a receiver when double conversion is used. (But in reverse now of course.)

With the exception of the overtone oscillator all circuitry is straight forward. Other tubes may be used in place of the 6E84 and 6BE6 if suitable changes are made to the grid and screen grid voltage requirements. Whatever tubes you use, make sure they are stable.

The Overtone Oscillator

This is really the heart of the whole unit. But first I will give you a little history of how this came to be.

When it was needed was felt for a unit of this type I originally used a 3.5 meg. crystal and endeavoured to operate it on its 3rd, 5th and 7th overtones. This I was able to do, but by the time I got to the 7th overtone the output was so small it was negligible. Also, as the frequency went up so did the frequency instability suffer. Although perhaps the idea had merit it had lots of disadvantages. So the next thing I tried was to operate on their fundamental but multiplied (by 3) in a further stage. This worked fine except that the switching was complex and also the unit produced lots of healthy signals in the output that "didn't ought to be there." The fundamental and second harmonics of the crystals were there in full uniform and these I could see, unless I slew them first, were going to cause me to have a little tet-a-tete with my friend the radio inspector. Thus it was, the idea of using an audio tone oscillator because it had output on its fundamental or second harmonic frequencies, was born. Of course, if you are able to obtain the fundamental crystals, able



The plate decoupling resistor and by-pass condenser of the first 6BE6 mixer are 220 ohms and 0.005 μ F. respectively.

the required output frequency, then you are very lucky indeed and the oscillator may be a conventional straight through job.

And so it was that four chassis and a mile of wire later, after having experimented with various overtone oscillators and mixer circuits, the capacitive feedback type of overtone oscillator was used.

For Output of	Use Crystal	Injection Freq.
3.5 - 4.0 Mc.	nil	nil
6.9 - 7.4 "	3.833 Mc.	10.9 Mc.
14.0 - 14.5 "	3.5 "	10.5 "
21.0 - 21.5 "	5.833 "	17.5 "
28.0 - 28.5 "	8.166 "	24.5 "
28.5 - 29.0 "	8.333 "	25.0 "

The crystals were from W.A.R.B. or disposals sources and I did not have too much difficulty getting them operating on their 3rd overtone. It is as well to know that some crystals may dig their toes in and refuse to budge when operated in this mode. If this is the case, try a different value of feedback condenser C3 and you may kick them into operation.

When operated as overtone oscillators as distinct from operating on a 3rd harmonic, the output frequency may not be exactly three times that marked on the crystal.

Output from the EL84 should be sufficient to drive an 813 ZL Linear to 100 watts and, indeed, on all bands except perhaps 10, there will be a large surplus of drive. This, in my own case, I dissipate in resistors paralleled with the output coils of the EL84.

Coils may be plug-in or band-switched.

Beware!

The output circuits of the EL84 will also contain the oscillator frequencies (24.5 megs. when on 10 metres for example). Make sure the grid circuits of the following tubes are tuned to the correct frequencies.

In conclusion, I mention that I also have a converter attached to my receiver using the identical principle in reverse. All signals are converted to 80 metres and the oscillator is an overtone, exactly as shown. In fact, for a while, I used the one oscillator for both transmitter and receiver.

Further Caution

Do not attempt to use a 3.5 meg. crystal operating straight through to mix with the 80 metre signal to get to 7 megs. The 3.5 meg. crystal will have a second harmonic which will feed through the 7 meg. circuits nicely. I know, I tried it!

Best operation is had here with a 12AT7. Other tubes had lower output and did not want to function as readily.

A RECEIVER FOR S.B.B., A.M. AND C.W.


The circuit diagram of Fig. 3 shows the receiver in use at this station. It is not pretentious nor expensive and was in fact constructed from ordinarily available parts, many of which came from the junk box, junk sales or ordinary radio service shops. Yet this receiver will perform as well as most of the more expensive American receivers and has, in fact, been operated right alongside a Collins 75A4 and gave almost identical results. To obtain these results there are one or two points I

must explain for these cannot be read from a circuit diagram.

(a) Use a steel chassis. The chassis must be **absolutely** rigid. In my own case I strengthened the chassis under the oscillator section by running brass channel 1" deep x 1/4" wide from front to back.

(b) The tuning mechanism must be **absolutely** rigid. There must be no tension between the panel and the tuning condenser. Even if a flexible coupling is used tension here will cause severe drift. My own tuning mechanism is ex-CR100 and bought at a junk sale. An ARC5 (or Command) receiver gang has an excellent gearing arrangement and it is not too difficult to arrange a slide-rule dial arrangement for the normal frequency reading. A logging scale fitted to the tuning shaft will give an excellent means of resetting.

(c) The receiver must not contain switched tuned circuits. The receiver covers 3.5 to 4 megs., and other bands are obtained by using a band-switched crystal controlled converter. This means that all bands will have the same sta-



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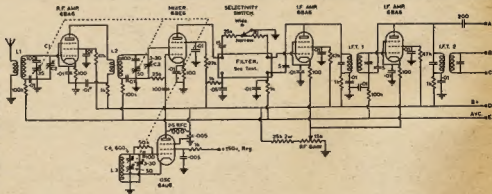
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- ★
- Fig. 3.
- Chassis 11 x 18 x 3 inch steel. C1-50/30 three-gang. C2-3-20 pF. midset variable (ant. trimmer). C3-3-30 pF. Philips trimmer. C4-500 pF. paddler. C5-Approx. 100 pF. Adjust value to obtain approx. 5v. of r.f. from b.f.o. (R.F. probe on v.t.v.m.). All by-passes disc ceramics. Use silver mica condensers in tuned circuits.
- L1-44 turns 34 a.w.g. enam. formed on 1/2 in. diam. form. (ARC5 ceramic former 30 can). Link 8 turns 30 d.s.c. a.w.g. at bottom L1.
- L2-As above. Link 8 turns.



How Good Are Your R.F. Chokes?

H. F. RUCKERT,* VK2AOU

It seems to be quite a popular belief that r.f. chokes are so critical and so difficult to design that Amateurs do better by buying these components. The various publications give little information, or the recommended design is so complicated, that there is little chance to build two chokes with the same characteristics. Some other types are so large that they would not fit into most transmitters. To this confusion comes the bad experience that in some cases the p.a. blew up, the choke burnt away with plenty of smoke, or that an 807 driver stage did not give enough power to drive a p.a. with another 807.

Therefore the author investigated the choke problem about 10 years ago and the details were published in the August and September issue of the "CQ" 1949 (now "DL-QTC"). A few years ago "QST" confirmed very well the findings of the writer, but somehow the choke problem still exists.

THE TESTING APPARATUS

Admittance meters (circuit of same shown in Fig. 1) covering the range 0.1 to 100 Mc. allow direct measurement of the high frequency resistance of r.f. chokes, and their series as well as parallel resonances were also determined. The apparatus consists of a signal generator, a calibrated tuned circuit, a low capacity diode with a substitution resistance which is calibrated, and a vacuum tube voltmeter.

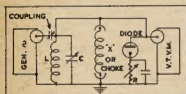


Fig. 1.—Admittance Meter.

The r.f. choke is connected in parallel to the tuned circuit (capacitors, coils, tuned circuits, complete r.f. stages, etc., may also be tested in this way). The tuned circuit is tuned to resonate at the generator frequency selected, with the choke in parallel, until the voltmeter shows maximum deflection. The coupling capacitor is adjusted to get exactly half scale voltmeter reading. The substitution resistance in the cathode lead of the damping diode is now at the maximum value, not allowing d.c. diode current to flow and so practically not representing a load parallel to the tuned circuit.

The choke is now removed, resonance of the test tuned circuit is restored by adjusting the air capacitor for maximum voltmeter reading, and the substitution resistor is so adjusted that again half scale voltmeter deflection occurs. The ohm value of the resistor now represents the h.f. resistance of the choke at this operating frequency.

A low value of 2 to 10K ohms indicates that a series resonance frequency was found if no detuning of the air capacitor was required to restore resonance. A parallel resonance frequency would be indicated if again no detuning was caused by the choke but a very large substitution resistor value was required to bring the voltmeter to half scale reading; this r.f. resistance may reach values as high as 5 megohms.

In this way several "popular" chokes and many Amateur-made chokes were tested by checking at a number of frequencies, especially around the Amateur bands between 1 and 100 Mc. A winding machine to make pie-type coils was also available.

THE PURPOSE OF A CHOKE

The r.f. choke has the purpose of representing as high an r.f. resistance as possible at the operating frequency or frequency band. If we have a p.a. tank circuit which has a load impedance of 3-5K ohms, our choke, which is parallel to the tank in the case of shunt feeding, must have at least a 30 times higher r.f. resistance—e.g. 100K ohms or more if possible. If the choke is operated at one of its series resonances, we shall shunt the tank circuit and the choke has to handle r.f. power until it goes up in smoke. At the same time, we get the wrong load for the p.a. valve and all the input (or a far too large amount of it) remains as dissipation power at the plate and not enough r.f. to the aerial. An overheated valve, red plate and gas instead of a vacuum will be the result. In the case of a driver stage, or p.a. grid choke, insufficient drive to the following valve will be indicated.

If a choke is operated near such resonances, their effectiveness will vary largely when operated over an Amateur band and the transmitter will not function uniformly over the entire band. If we try to avoid shunt feeding and use chokes only in the r.f. cold leads of the plate and grid circuit we may be lucky, but there is the chance of inefficient by-passing and the strong resonances of the choke could still be the reason for I.V.I. due to a resonance falling on a harmonic frequency which may be near a tv. channel. There is therefore only one safe way and that is to understand the choke and to use the correct design.

MEASURING RESULTS OF TYPICAL R.F. CHOKES

Curve 1 of Fig. 2 shows the r.f. resistance v. frequency of a popular choke consisting of five pie-wound coils of different size (number of turns and inductance). The expert who designed this choke claimed that this is the best way to prevent individual resonances of the various coils from showing up. As we can see, the resonances are still there and this choke could not be worse, because every coil has its own series and parallel resonances.

These "Xmas tree" type of chokes cannot be recommended at all. Some twenty chokes of this type (with different numbers of turns and coils) were tried, but the results were always absolutely useless. Curve 1 shows that even at parallel resonances the resistance is too low, indicating that the inductance of 0.6 mH. is already too much for frequencies above 10 Mc. We can now imagine how little effective the popular 2.5 mH. will be.

The next choke (Curve 2, Fig. 2) had four identical pie-wound coils, but the inductance was very high (4 mH.). The resistance is even low at 3 Mc. and inadequate at higher frequencies.

We now tried a small choke (Curve 3) of $\frac{1}{4}$ " diameter and $\frac{1}{2}$ " long which had a small iron dust core. The inductance was only about 100 mH. coil only, the parallel resonance was at 30 Mc. and a value of about 2 megohm was achieved. This simple and small choke was therefore very much better than the expensive types. This choke had only 17 μ H. inductance after removing the slug.

Some more tests were made with pie-wound chokes using identical coils (Curve 4) in an endeavour to obtain less resonances. This example was a choke with seven coils having 20 turns each. Due to the identical windings, the combined series resonance was extremely sharp, being at a common frequency near 28 Mc. This choke would cause some trouble if connected to a 28 Mc. p.a. stage, because the tank or grid would be shorted out.

After many tests, a small choke with four identical pie-wound coils (Curve 5) having 40 turns each was developed. The core was a two-watt resistor after the carbon was removed. By adjusting the distance between the coils to about $\frac{1}{4}$ " and selecting a critical distance to the metal cap at the ends of the core, it was possible to have only one series resonance near 21 Mc. and this one was no longer deep (100K ohms). The inductance was only 120 μ H., which is just the right "L" for chokes covering the range 3 to 60 Mc. The four coils were glued to the ceramic resistor body with polystyrene.

In a 150-watt transmitter one of these chokes was connected in the B+ line at the cold end of the p.a. tank. The transmitter got fairly warm during contests and after some time the writer had a look inside the transmitter and found that the magnetic pulse, when throwing the stand-by switch, had pushed all coils close together at one end of the core. These pie-wound coils have also the disadvantage that in shunt fed circuits with high r.f. voltage (modulated p.a.) the volts per layer easily become so high that voltage breakdown occurs between wires of different layers and the choke burns up.

The conclusion was that the old rule of thumb—use as much wire for the

* 25 Berrille Road, Beverly Hill, N.E.W.

choke as a quarter-wavelength of the operating band is (or middle of range) and wind a single layer coil with a length two to three times the diameter — is still the best method.

A PRACTICAL CHOKE

For a 3.5 to 30 Mc. transmitter, the choke parallel to the tank (hot end of pi-coupler to B+) may have the following dimensions: Diameter 0.8", the length of coil winding 2.4", 90 turns of 23 gauge wire; L = 50 μ H. The wire should be enamel and 2 x silk covered, thick enough to carry the d.c. plate current plus the audio modulation current without getting warm. This choke has no resonance holes between 3.5 and 30 Mc.

After installing the choke in the transmitter, we can easily check the performance. A small neon lamp may be held near the choke and by moving it down from the hot to the cold end, the light should become less and less. If the light extinguishes before we reach the end of the choke, we have most likely too many turns. But if the light is still bright with the globe near the cold end, then the choke is too small. When doing this test with the transmitter on and running high power, it is advisable to keep one hand in the pocket, and the neon globe must only be held by the glass.

With the transmitter switched off we also can check the choke for resonances with the g.d.o. There should be no dip near any Amateur band.

AMATEUR STATION AT TRADE FAIR

It is proposed to install a Ham station at the Trades and Industries Fair to be held at Cairns, Qld., on 1st, 2nd and 3rd October. The station will be operated under the call sign of VK4ZW and it is hoped to work on 7, 14 and 21 Mc.

All Amateurs in Cairns will do the operating and will be seeking contacts with other Amateur Radio stations. It is requested that Hams make a point of looking out for VK4ZW while operating at the Fair and give that station many contacts.

It is anticipated that a special QSL card will be printed and sent out for all contacts made.

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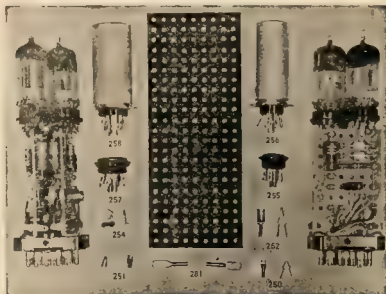
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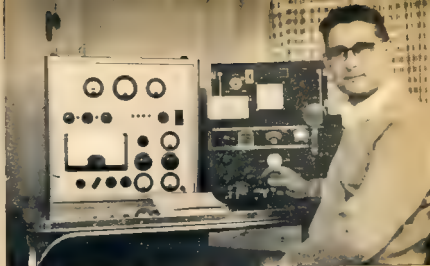
ANDY ROUDIE* VK3UJ

ANDY was born in Melbourne in 1913. During the period from 1924 to 1930, many types of crystal sets and battery receivers were constructed for broadcast and short-wave reception, this providing the initial interest and experience in Radio.

During the following two years, he completed a Radio Course at the "Working Men's College," now the Royal Melbourne Technical College, and the A.O.C.F. was obtained in 1932.

QSO No. 1 was with VK3CX, using a 201A t.p.t.g. transmitter early in 1932. Since then, Andy has operated his station from seven locations in and around Melbourne, the present one at Croydon, 18 miles east of the city and 450 feet above sea level, being quite good for both reception and transmission.

*Croydon Way, Croydon, Victoria.



The photograph shows the present station equipment and the operator himself.

The transmitter uses a Geloso v.f.o. into a parallel pair of 5146s with pi-coupler output; the modulators being a pair of EL34s. All bands from 3.5 to 28 Mc. have been worked on both phone and c.w., but at present only dipoles

are in use on the 7, 14 and 21 Mc. bands.

The receiver is an AR88D, tuning from 500 Kc. to 32 Mc. Above the receiver is the frequency meter.

Other interests include 7 Mc. mobile and portable operation, photography and l.p. record reproduction.

THE BASS STRAIT FERRY—VK7 END

FOR the benefit of mainland Amateurs who anticipate a holiday tour of Tasmania I offer some advance information from the point of view of Mobile and Portable Radio operation.

The starting off point is, of course, Devonport. Here we have half a dozen active VK7s. Twelve miles westward along the coast at Ulverstone are two members, another 18 miles west at Burnie and districts are nine VK7s. It may be of interest to mention that all Amateurs in the above areas are members of the W.I.A.

Therefore, it should be comparatively easy to make contact with some locals in this area.

Going in the opposite direction, to the East, 35 miles away, Deloraine is reached, at an altitude of about 800 feet. From here one can turn off to the South over the central highlands, 4,000 feet, or proceed East another 30 miles to Launceston. Here again are active VK7s.

Going back to Deloraine, if one cares for mountain scenery and lakes (and the Great Lake is about 100 miles round the shoreline) despite the not-so-good road, the trip over the mountain is one that is worthwhile and from the elevation, the possibilities of QSOs, particularly on v.h.f., are inviting. The Great Lake is 25 miles from Deloraine, and from there one may drive along the Lake shore and down the southern slope to Hobart. At Hobart, where the W.I.A. is a very active body, one will find many VK7s spread over the whole district, and contacts should be quite easy. The distance back to Launceston from Hobart is 120 miles of good road. In passing, while in Hobart, be sure to

drive to the top of Mt. Wellington with mobile gear, over 4,000 feet up, and view the t.v. activities. A couple of hours will cover the trip comfortably.

Of course there are lots of other places to go. The East Coast is magnificent for its beaches, and the West Coast is something of another world—140 inches of rain per year.

Now we have dealt with internal interest in Tasmania, but what about contact with other States. Well it isn't much over 200 miles from this coast to VK3 and across water at that. My list of contacts with mobile and portable VK3 and VK2 is quite a long one. Therefore, from here, one can expect to

contact many VK3 and other States with comparatively low power.

For some months I used 8 watts and made dozens of contacts with VK2, 3 and 5.

So some final advice—bring the mobile and portable gear even at the expense of leaving the XYL behind.

Anchor it down firmly, if you intend to leave the main highways. A piece of strong cord with a weight on the end is useful to throw over a tree to raise the antenna, and there are lots of trees here.

The VK7 fraternity looks forward to seeing many Amateurs from other States, and will be pleased to furnish information.

—VK7MX, Devonport.

TROPOSPHERIC PROPAGATION AT V.H.F.

(Continued from Page 3)

with anticyclones during the colder months. A high such as this is worth watching at any time of the year. The dotted lines on Fig. 6b represent the sounding on the 20th and the solid lines that of the 21st. The graph of the 22nd was almost identical with the latter. On the 20th, at the leading edge of the high, there was a small temperature inversion between 4,200 and 5,000 feet averaging about 0.4°C. per 100 feet, and in the same layer the mixing ratio dropped about 0.35 g./kg. per 100 feet giving a total refraction a little less than required. On the 21st and 22nd the gradient had virtually disappeared, thus it must be assumed that the propagation on those evenings was due entirely to surface cooling. Propagation

on the 20th was probably assisted by the same effect.

How About 288 Mc.?

There appears to be no reason why the information in this article should not apply with equal force to one metre with the possibility that ducting should be more frequent. With the increasing use of stabilised gear it should not be long before the distances covered will be comparable to those on two metres, with some paths, particularly over water, favouring the higher frequency. The first contact across Bass Strait on 288 Mc. cannot be far off. That is how it goes—there is always the challenge to improve the gear and extend the range. See you on v.h.f.!

ACKNOWLEDGMENT

The assistance of officers of the Commonwealth Bureau of Meteorology in Melbourne, particularly Messrs. Gibbs, Leake and Lloyd, in providing access to meteorological records is gratefully acknowledged.

Why So Few Entrants in the N.F.D. Contest?

The National Field Day Contest is probably one of the contests offering the best attraction to those who are keen lovers of the outdoors, those who have family responsibilities and those who just look forward to a "different" day by way of relaxation. And yet it is hardly patronised. There must be reasons for this and the Federal Executive, Federal Council and Federal Contest Committee are anxious to know what they are before giving it up.

Many efforts have been made to popularise this Contest with little success. The Federal Contest Committee have currently forwarded proposals for rule making which you should have an opportunity to read and criticise. The Federal Council is currently considering these proposals and your comments could be helpful in its decision. These are the proposed rules:—

PROPOSED RULES

Date of Contest: Saturday and Sunday, 13th and 14th February, 1960.

Duration: 1800 hours E.A.S.T. Saturday to 1800 hours E.A.S.T. Sunday.

1. There shall be three sections to the Contest:—

- (a) Transmitting, Phone.
- (b) Transmitting, C.w.
- (c) Reception of Portable and Mobile Stations.

2. All Australian Amateurs may enter for the Contest. Mobile or portable stations shall be limited to an input of 25 watts to the final stage. This power shall not be derived from either private or public mains.

A portable or mobile station shall not be located within a radius of one mile from the home(s) of the operator(s), nor be situated in any occupied dwelling or building.

No apparatus shall be set up at the site selected earlier than 24 hours before the commencement of the Contest.

A portable or mobile station may be moved from one site to another during the Contest.

More than one transmitter may be used, and where there are multiple operators several bands may be used simultaneously, but in this case a separate log shall be submitted for each transmitter.

All Amateur bands may be used, but cross-band operation shall not be permitted.

3. Amateurs may enter for one or both transmitting sections.

4. One contact per station for phone and one for c.w. per band shall be permitted.

5. More than one operator may participate in the operation of a portable or mobile station provided that all operators are licenced Amateurs.

6. Entrants must operate within the terms of their licences and must observe the Regulations with regard to portable operation.

7. Serial numbers consisting of the RS or RST reports plus three figures beginning with any number between 001 and 100 and increasing by one for each successive contact shall be exchanged.

8. Scoring:

For contacts with portable or mobile stations outside entrant's own State	15 points
For contacts with portable or mobile stations within entrant's own State	10 "
For contacts with fixed stations outside entrant's own State	5 "
For contacts with fixed stations within entrant's own State	2 "

The following shall constitute call areas: VK1 (A.C.T.) and VK2 combined, VK3, VK4, VK5 (South Australia), VK6 (Northern Territory), VK6, VK7, and VK9.

9. **Logs:** All logs shall be set out under the following headings: Date/Time, Band, Emission, Call Sign, RST/Nr. Sent, RST/Nr. Recd., Points Claimed. In addition there shall be a front sheet showing the following information: Name, Address, Call Sign, Section, Call Signs of other operators (if any), Location of Portable/Mobile Station from ... hrs. to ... hrs., from ... hrs. to ... hrs., etc. A brief description of the equipment used, bands used, points claimed.

Declaration: I hereby certify that I have operated in accordance with the Rules and spirit of the Contest.

Signed..... Date

10. The right is reserved to disqualify any entrant who, during the Contest has not observed the Regulations or who has consistently departed from the accepted code of operating ethics.

11. The decision of the Federal Contest Committee will be final, and no dispute will be entered into.

12. Certificates will be awarded to the highest scorer in each section in each State.

Receiving Section

The Rules shall be the same as for the transmitting Stations and is open to all Short Wave Listeners in the Commonwealth and Mandated Territories

Logs shall take the same form as for transmitting sections, but will omit the serial number received. Logs must show the call sign of the station heard, the serial number sent by it, and the call sign of the station being worked.

Scoring will be on the same basis as for transmitting stations. It is not sufficient to log a station calling CQ.

A station heard may be logged only once for phone and once for c.w. for each band.

Certificates will be awarded for the highest scores in each State.

Address of Logs

All entries must be postmarked not later than Saturday, 27th February, 1960, and addressed to the Federal Contest Committee, W.I.A., Box 371B, Hobart, Tasmania.

COMMENTS

The Federal Contest Committee have issued the following comments:

It is felt that the time and duration might encourage camping, with several operators per station. Note that contacts with stations outside entrant's own State includes overseas contacts.

The number of sections has been reduced to three. In the 1959 Contest there were no entrants for the v.h.f. sections, and in any case the high number of sections for the relatively small number of entrants seemed rather ridiculous.

The number of certificates to be awarded has also been reduced for the same reason.

Open sections have been omitted as in our opinion they are a farce, anyway. Entrants can enter for either the phone section or the c.w. section, or both.

Omission.—In the case of contacts outside of VK it might be desirable to include a clause stating that no serial numbers need be exchanged, but a serial number entered in the log for such contacts.

★

There you have it . . . an opportunity to tell the Federal Council what is wrong with the Australian National Field Day Contest in comparison to the overseas events which are the most popular of contests. Write your comments direct to the Secretary, Federal Contest Committee, 22 Haig St., Lenah Valley, Hobart, Tasmania, to reach him by the third week of October.

YOUR STATION COMPANION,
the . . .

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A-F Power Amplifier and Modulator, Class AB2

Values are for two valves

Plate: 750 V. at 240 mA (Max. signal).

Screen: 165 V. at 20 mA (Max. signal).

Power Output: 130 W. at 10% total distortion.

Drive: 0.4 W., 108 V. Peak A-F grid to grid.

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Plate: 600 V. at 112 mA.

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Power Output: 52 W.

Drive: 0.4 W., 107 V. Peak R-F grid Voltage.

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and 167 QUEEN ST., MELBOURNE

BOOK REVIEWS

MAGNETIC SOUND RECORDING

By D. A. Snel

This new book from the Philips Technical Library covers the subject in a way which should prove of considerable value to all who own, use, or contemplate building magnetic recording equipment.

The first chapters give an introduction to sound and history of magnetic recording followed by magnetism and electricity and then to the process of magnetism and requirements for recording.

In turn, sections on drive mechanisms, tape and heads, amplifiers, microphones, and loudspeakers have been well covered with theory and practical drawings and illustrations.

The section on practical recording was found to be interesting due to the variety of uses and suggestions, and also on account of a previous embarrassing experience caused by a lack of some of this knowledge at the time.

Following chapters deal with stereophonic recording and playback, which will no doubt be a feature of future recorders, together with dictating equipment, magnetic sound for films, faultfinding and many other applications for magnetic recorders and recordists, all amply covered.

Having experienced some of the troubles contained in this book while building a tape recorder makes me appreciate the information, and it is felt that it will save many others from similar mistakes with consequent disappointment and expense.

From the point of expense, the price of 30/- Australian could save costly mistakes and pay for itself in the construction of a magnetic recorder and still be a very good reference in the technical library.

Available from Philips Electrical Industries Pty. Ltd., 69 Clarence St., Sydney.

MULTIVIBRATOR CIRCUITS PRACTICAL ROBOT CIRCUITS

These books have been grouped together because they were written by the same author. The first one covers the theory of the multivibrator in all its many variations. The second, deals with the applications of these same circuits, in this case, to control a robot dog.

I do not expect there will be very many Hams who will build the electronic pooch, but all of us can benefit from the theory and practice described in these very inexpensive volumes.

Both volumes by A. H. Bruinsma from the Philips Technical Library. Australian prices: 13/- and £1/10 respectively.

RADIO ENGINEERING FORMULAE AND CALCULATIONS

By W. E. Pannett

The aim of this publication is to assist "those who wish to improve or revive their ability to cope with radio engineering problems". However, the only advantage of this book over similar volumes which list Radio Formulae is that it gives worked solutions to many examples, showing how one goes about solving such problems.

Nearly all aspects of Radio Engineering are covered. The section on Transmitters would be quite useful to Amateurs, in spite of its brevity. The treatment, however, is rather superficial, particularly in Example 1, where, in calculating drive power to the grid of a final amplifier (class not stated), the r.m.s. grid voltage is taken as average voltage.

The section on Transistors is very brief, and does not seem up to date as might be expected of a book published in 1959. For example, the list of basic Transistor Amplifier circuits is misleading in the way it classifies grounded-emitter types as suitable for audio fre-

quencies only. Similarly, the current gain in this circuit is referred to as "alpha", whereas modern convention refers to this usually as the "beta", the Beta Gain.

The list of classes of amplifiers, A1, A2, AB1, etc., is a useful feature in the section of Thermionic Amplifiers. The tables of power and voltage ratios to decibels, of frequency to wavelength, and the usual mathematical tables are quite useful, but others, such as the very handy L.C. Reactance vs. Frequency chart, are not included.

On the whole, the formulae and methods of calculating answers are well set out, but the treatment is sketchy (for example, horizontal dipoles are not mentioned in the section on Aerials and Propagation), so that it cannot replace the more comprehensive and authoritative texts such as Langford Smith and Terman.

A Newnes publication. Price in Australia 29/-. Our copy from The Technical Book and Magazine Co., 295 Swanston St., Melbourne.

THE HAM

There are fools of every kind
And the most of them are blind
To the folly of the game that they pursue,

And they each and all declare
That their own peculiar fare
Is the finest in the world, "if you knew".

The Footy fiend loves mud,
Has the fever in his blood,
And the Funter to the Bookie gives his cash.

While the Cricketer will run
Up and down 'neath blazing sun,
And the Pugilists each other love to bash.

There's the bloke in dancing shoes
And the fellow who loves booze
While the Golfer hits a ball with many damns.

But the maddest of the crowd
Are the ones who talk aloud
When there's no one but themselves.
They call 'em HAMS,

They sit beside their box
And enjoy their little talks
About voltages and frequencies and bands,

And they never go to bed
For they're funny in the head
With the knowledge that this sort of thing demands.

If you ask him which is greater,
Eight o seven or oscillator,
He will tell you you are widely off the beam,

That your relay and transformer
Are away to some place warmer
And your ohms and watts are only just a dream.

They have wires every-where
Even high up in the air,
But their hobby is the best of all, by far.

It makes a happy home
For they never care to roam
And their wives can always tell just where they are.

"HAM" SPEARE.

[The above was written by Mr. Jack Burrows, Snt., father of Jack Burrows, Jr., VK6BU.—Editor.]

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Proposals for a Mobile Receiver Without H.T.

H. F. RUCKERT,* VK2AOU

WE heard recently about the hybrid car radio which was made possible by the introduction of "special valves" which can work satisfactorily with 12 to 14 volts B+, and the audio power stage has to be transistorised. Even the short wave range up to 19 Mc. did show sufficient gain as demonstrated in one publication. If a car radio achieves μV sensitivity at 19 Mc. there is a good chance that the same set up will work at least up to 30 Mc., and most likely also at 60 Mc. We may have to accept at v.h.f. a higher noise figure, resulting in reduced sensitivity, than would be possible to obtain with the full high tension voltage.

Looking closer at the data of the so-called special hybrid valves, one gets the impression that these valves are not so very special or new in design. We remember that the stage gain is the product of resonance resistance of the tuned circuits and of the dynamic gm. of the valve used. If we assume that the design and Q of the tuned circuits of r.f. and i.f. stages are conventional, we have only to see that the valves have a sufficient high gm. with the low B+ voltage of 12 to 14 volts.

The quickest way to get an answer and practical results, was to build a simple test circuit around a valve holder and an i.f. tuned circuit. With the signal generator attached to the input and a vacuum voltmeter to the output, the stage gain was easily measured. With the help of a five kilo-ohm potentiometer in the cathode lead and a 50 kilo-ohm potentiometer to adjust the screen voltage, the best working conditions were soon found. A compromise can be found where we get good gain, little stage gain variation with B+ voltage variations and a relatively wide range of output voltage with low distortions.

The test did show that useful gain can be achieved with valves which have at least a static gm. of 5 mA/V. at 150 to 250 volts B+; with a lower B+ voltage the remaining gm. is only 10 to 20% of the usually listed value.

The following valves were tested: EF50, 6AC7, 6AG5, 6AK5, 6AU6, 5847 (gm. = 11 mA/V.), 12AU6, 277 (gm. = 9 mA/V.).

Since the operating frequency was 455 Kc., the v.h.f. properties of the more modern valves did not show up, and the valve with the highest gm. gave naturally the highest i.f. gain of 100 to 200 for the 6AC7, 277 and 5847 valves. The valves with lower gm. of about 5 mA/V. at full B+ resulted in stage gains of 40 to 100. The usual receiver design considerations and these gain figures give us several hints how to plan the circuit, if we wish to use popular miniature valves only. The r.f. stages may be equipped with 6AK5 types. The same valve may be used for the mixer stage and oscillator, using grid one injection and a triode oscilla-

tor. 6BA6 valves may be used for the i.f. to make use of the remote cut-off curve these valves possess. To reduce the battery power consumption it may be advisable to use GE diodes to obtain the audio and a.v.c. voltage. A OCT1 audio pre-amplifier transistor and a matched pair of OC72 transistors should be all that is required to drive a small loudspeaker.

There are several advantages:

Running the high gm. valves with such a low B+ voltage reduces greatly the difficulties to prevent take-off, and stable operation is easily achieved.

Two valves may be connected with their filaments in series to suit the 12 volt car battery.

There is no expensive, noisy and unreliable vibrator requiring also complex hash filters.

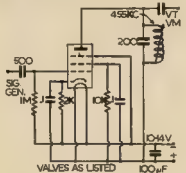


Fig. 1
In the above circuit the B+ line should have been connected to earth.

The receiver will be very much smaller because there is no power supply taking up about 50% of the volume and even more of the weight of the usual car radio.

Low voltage components have less bulk too, so that all paper capacitors can be replaced by thin sheet ceramic HK (K factor 9000) units which have 0.05 to 0.1 μF capacity at 40°C. These are discs with 1/2" diameter.

The resistors used can be all of the one-tenth watt version, because extremely low loads occur due to the small voltage applied.

A receiver with five valves and three transistors would only represent a load to the 12 volt battery of 1.8 amp.

50 Mc. W.A.S.

Call	Cer. Add. No. Contr.	Call	Cer. Add. No. Contr.
VK3WJ	13 4	VK2AEZ	10 1
VK3PG	5 3	VK3KA	11 1
VK3VW	8 2	VK3GM	12 1
VK3RY	2 3	VK3ACL	14 1
VK4HR	4 2	VK3ZD	16 1
VK3LC	1 1	VK3HO	17 1
VK3DW	2 1	VK3ZANG	8 1
VK3RR	6 1	VK3WH	15 1
VK3HT	7 1		

With the exception of the cathode bias resistor, the screen grid resistors and the use of audio transistors, there is no change in the circuit comparing standard receiver design. It is not advisable to use resistors in plate circuits because they would further reduce the B+ voltage, which would not only affect the gain but it would also reduce the input voltage which can be applied to the grid before distortions in the plate circuit occur.

The test circuit shows typical operating conditions for an i.f. or r.f. stage. It is advisable in every case to vary the cathode bias resistor between 500 and 5,000 ohms to find the best value for the valve used.

SOMETHING DIFFERENT

For something non-technical and different for your book shelf, may I suggest Thomas H. Randall's "The Nymph and the Lamp." This novel and classic so aptly written, portrays the life of a wireless operator, based on a lonely strip of sand in the North Atlantic, and of the affairs of the heart that overtake him.

It will stir the blood and the imagination of all those who have ever pressed a key or sent a signal into the ether. It will, as he completes the page, turn him with vision and appreciation to the woman who is in every man's life. —VK4SS.

D.X.C.C. LISTING

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE

Call	Cer. Cnt. No. ris	Call	Cer. Cnt. No. ris
VK4RU	2 222	VK4KW	4 188
VK6MK	43 381	VK3BZ	3 174
VK4PJ	21 313	VK4RW	33 104
VK3WL	14 211	VK3RE	10 103
VK3ATN	38 204	VK3DB	31 181
VK4HR	12 158	VK4WZ	16 160

New Members
VK3VY - 60 103

C.W.

Call	Cer. Cnt. No. ris	Call	Cer. Cnt. No. ris
VK4PJ	39 348	VK3XG	48 213
VK3KB	10 345	VK3NC	19 305
VK3CK	36 340	VK3YL	39 303
VK3PH	15 328	VK3BY	40 302
VK3ID	6 322	VK3RU	19 301
VK4HR	8 318	VK3EO	2 161

Amendments
VK3KW - 40 113

OPEN

Call	Cer. Cnt. No. ris	Call	Cer. Cnt. No. ris
VK4PJ	32 331	VK3EM	74 225
VK2ACK	6 260	VK3XU	61 221
VK6RU	8 250	VK3HG	51 215
VK4HR	7 228	VK3JL	19 210
VK3BZ	4 231	VK3ATN	89 210
VK3WL	40 230	VK3AC	77 209

Amendments
VK3KW - 13 305

can't hear them here. Max did hear 4NG and 4ZAP2 at 1815. Sunday 30th
1 Metre. Colonel 4DR was in contact with
M1rx 4ZAA one evening, working cross band
1 and 8 mc. Quite a bit of activity on 2 and
1 mc in Brisbane. Even 4Z31 up amongst the
trees thinking that way!—4ZRI.

SOUTH AUSTRALIA

Activity on 288 Mc has slowed down a little
during the last month. Main signals heard from
this location are 5J8, 5ZCI, 5ZDJ, 5ZGX, and
5ZVJ. John 5ZEA will be in VK3 land when
these notes go to press. John is now build-
ing up some portable 288 Mc. gear for use
over there and I hope he will be successful, give
all the 5Z's hope our best.
Whether Al 5ZCB has contact at Pine Lodge
(ADP's location) or not, I'm not quite sure, but
he provides 240v. power for our 288 Mc.
stabilised gear that can be used to power the
Mount to VK3 land. Go to it boys, here's
your chance.

Information for VK3 boys on 144 Mc. is that
we have Rodney 5ZCD living at Bordertown
using a Gelson. Rodney listens on 3.5 Mc. and
7 Mc. as well, to suggest you try crossband
with him. At present he is on low power
but intends to stink up an 838B.

Now for those boys who want the Worked
and QSO'd on 144 Mc. I have a few words
for your chance. VK3 is proud to present you with
that chance. John 5ZDL will be leaving for
Darwin on 1st Oct. He is taking 144 Mc. and
him mobile gear running 80w. John will be
on relieving duty for three months, but hasn't
indicated whether he will QSL from there or
his address.

I have further information about Reg 5QW's
s.a.b. effort; he used the phasing system on
low power with good results, but is now build-
ing a xtal lattice system. Reg claims that the
gremlins are working against him for after
grinding three rocks and getting them spot
on the fourth one he disaster. We have 5Bran
5Bran 5ZCS has a strong signal here but his
modulation is well down. Hughie 5AV has been
very busy during the last month. He has a
portable location. Others heard on the band
are Keith 5MT, Col SRO, Neil 5ZBH, John
5ZDI, Ed 5ZJ and Gordon 5ZVJ. Al 5ZCB's
beam is down at last for alterations. He
claims. According to some chaps I know this
is not correct; they claim that the chewing
and spitting out of the antenna is the cause.
Berry 5ZBZ and Graham 5ZAP still tearing
around with their mobile rig. Graham claim-
ed to be a 100% 144 Mc. antenna. I have
to join you shortly boys, I have a re-build
the mobile gear using screen modulation. The
power supply is the next item.—5ZAW.

NORTHERN TERRITORY

Here commence the monthly notes concerning
W.A. in the Northern Territory. Previously
we had 4Z31 on 288 Mc. and 4Z32 on 144
and 2 mc. Now, after my transfer to R.A.A.F.
Darwin, the call is VK3ZHW. Some information
for these W.A. enthusiasts supply and converter
are under priority construction, much of my
gear having been misplaced in transit. I will
be here for at least 15 months, operating 5 mc
and 2 mc as well as the band between 1 and
100 mc. I have a 100 mc. doubler, 288 mc. running
approx. 15 watts into (I hope) a 5 cl. 782. A
100 mc. power supply is under construction at
Townsville, and will eventually be finished
here. Hours of operation will mainly be 8.30
p.m. Darwin time, until the band goes out
each night of the week with the exception of
Wednesday, Friday and Sunday, as I work in
the protection box at the R.A.A.F. c.p.m.
between 1 and 100 mc. I have a 100 mc. p.m.
I will be on the band, naturally enough. All
things going as hoped, I should be on the air
by August 8, at the very latest, depending now
on the power supply. I have ordered from Sydney.
Do hope to be able to talk some of the local
boys into coming up on 5 mc also.—5ZBW.

We are planning to have a 100 mc. m.a. to
provide the gang with many contacts and may
all good DX come his way.—5QF.

PAPUA NEW GUINEA

On April 25, 5AHL heard 9XK but Russ went
back to work 4ZLC and 5ZLCST, 0940-35. At
1015 Russ heard 9XV7V (beacon) with his
beacon on 100 mc. I have been making a
direct bearing. Same day, 2500-3100, he
worked JA4 and KAI.

On April 30, 5AHL and JA, May 1, JA1, 2,
4, 6, May 21, VK3HE, 680 at 1034. Russ will

S

Maurice Cox, WIA-L3555

Flat 1, 37 Boyd Crescent,
Olympic Village, Heidelberg,
N.J.3, Victoria.

Hi fellows! Here is your scribe once more with
the news and doings of the Short Wave
Listeners of Australia. Hope you are all well
and your ears have been glued to your rx's
these cold winter nights.

In the last month or so I have had some
very nice letters sent to me and I want to
thank all those who have written to me. Now
here is the first one from BERS303, Don
Granley, of Spring Valley, Holbrook, VK1-
land, he writes—

"Main object in writing to you is, apart from
introducing self, is to ascertain just what help
I can give you in writing the page. As you
know, I always sent a bit of dope on to Ian
when he had it, and I am only too pleased to
do the same for you. However, I would like
to know just the type of thing you want,
personal news is out as far as I am con-
cerned, unless of course it is something out
of the ordinary, but I do gather a lot of a.i.
information from the various a.i. groups. I
am a.i. group in other countries, and of course
you can have the doings of the Albany group."

"Very pleased with your first effort at our
page, and I do trust that you have no trouble
maintaining it at the high standard which you
have set. Very interesting, this VK3 challenge
re the R.D. Contest. Ian Thomas feeling a
little 'bored' with the challenge, and I do
hope that it is a great success for all con-
cerned."

Thanks Don for your letter, by now you
have received my letter. Hope to hear
from you again soon.

The letter from George Glendinning
and he mails from Mackay, VK4-land and he
writes—

"I have read your first notes in 'A.R.' 7/50
and I wish you all the best of luck. I am at
present studying for my licence by correspondence
with W.I.A. I am a very active a.w.l.
do not think that you have any club in
this area, if there are I would appreciate it
if you could help me locate same. If there are
not, I would be very happy to help you find
ing same? I will be only too happy to forward
any s.w.h. information I receive or hear."

Well, we'll have a letter from
the "Cinderella State," hi, and they write as
follows—

"Fortunately, we see by your notes that Ian
is still interested in a.w.l.ing and that you are

worked KR6 and V5C3 several times and has
had 83 KH contacts plus about 300 JA QSOs
this year. The 11,000 volt transformer nearby
still gives him very bad QRM.

The only JA ever heard by him in full day-
light was JASBY during the Ross Hull Con-
test. Russ will be on 50 Mc as often as pos-
sible until the QRM and the winter when he will
be coming south on leave.—3AHL.

AMATEUR TELEVISION TRANSMITTING

An A.T. Convention was held at Geelong
the week-end July 19. As far as is known,
this was the first A.T. Convention held in
Australia. Charlie 3AAR and Geoff 3AUX
brought Eric down to the convention and
there. Eric will be remembered from his ex-
cellent series on "Amateur Television" in
"Amateur Radio."

After the morning session the visitors had
lunch at Dick 3AAR's place and inspected the
shack. The afternoon session was again held
at Bill 3BU's shack with 3AAR, 3AJS and
Fred's son David present. Peter 3ZAV also
called in. Charlie had his flying spot scanner
also show his 358 mc. converter. Geo-
rge 3AJS and 288 Mc. gear in his car and some
mobile contacts were made. Eric described,
with some aid from Geoff 3AUX, the use of
t.v. tx which uses some 300 valves. He was
kept busy answering questions most of the day.
Lecture tapes from the British Amateur T.V.
Club were run. Anyone interested in A.T.
should contact 3AAR, 3AUX or 3BU. Bill
3BU has the tapes and is on 71 Mc. most
days at 2.30-3.00, 1800, Sunday nights at 3000
on 3500 Kc.—3BU.

In contact with him. This will save us a great
deal of typing as he can put you right on the
track as regards our efforts to get this group
working in W.A. You probably have your
own ideas as to how to run the a.w.l. column
and anything you can do to help us out in
that regard, we will be more than willing to
do. Looking forward with a special interest to
hearing from you personally, at least, look-
ing forward with interest to the next issue of
'A.R.' Remember, W.A. is the 'Cinderella
State' and any little thing that you could pos-
sibly do to help us out in our efforts to obtain
the same sort of official recognition and
privileges which you apparently enjoy in
other parts of the world, we would be more than
grateful for your help in that regard."

With regret we announce the passing of
WIA-18018, W.D. Brennan, late of 34 Kitchener
Road, Werribee. He unfortunately died
after a long illness on the 29th of 30, leaving
a wife and three young daughters, and had
just completed the Q Plus 17 inch set and also
1 & K, 8 inch job, and so naturally he was
looking forward to advent of t.v. in W.A.

S.W.L. OF MONTH

Re your a.w.l. of the month, you've got it
boy, herewith!

Mrs. R. S. Hardwick, of Rivervale, a close
suburb of Perth, W.A. Age—the usual age of
the month—46 months. Wavelength—11.7 m.
a 9 valve, 1 waveband W.A.A. rx. in between
working from 8 till 8 at the local Affliction
Dialysis Hospital, W.A. a big maternity hospi-
tal, as a receptionist and booking-in clerk
and as a helping mother, and now finds
herself knocking out the usual 1000 words a
day as typing the O.M.'s reports of reception and
carrying on the work as honorary secretary
of the W.A. 4th job, and so naturally he is fol-
lowing imposing list of 5Gures and letters
after her name: New Zealand DX Radio Assoc.
—1740; Radio Society of Western Australia—
231.

And now we follow up with Mr. F. W. L.
Hardwick, of the same address. He operates
on the 40 m. band. As a 40 m. operator, his
position of not having to worry about his
correspondence once he has succeeded in tying
up the 40 m. band, is a very pleasant one.
In radio dates back to ante-depression times. In
fact his first recollection of wireless is trying
to pick up some stations long before broad-
cast radio was even a thing. His equipment
which if he remembers rightly, consisted of a
piece of carbon from a pencil resting on the
points of a crystal set. His equipment consisted
of wood, a pair of headphones, a torch battery
and a coil of wire on a 2-inch former with a
sliding contact on top. From there he gradu-
ally built up his equipment, and now has a
very vivid recollections of a lot of blown
fuses in friends' homes. He has his hands full
with the maintenance of his equipment, and
as a trust as a spring-smith, what with cooking,
DX'ing and being President of the S.W.L.
Group. His numbers are: W.A. DX Radio Assoc.
—5708; Radio Society of Western Australia—
18001.

VK3 S.W.L. GROUP

Last meeting of the S.W.L. Group of the
Victorian Division was held at the shack
of VK3JQ. Five members of the Group had
a most enjoyable evening. When we arrived
we found the shack with a few extra valves
and myself had words with him, the others
being make shy. Contact was a bit difficult at
the time due to QSB and QRM.

The evening session started with the
40 mc. dipole, then the tx and rx—all
house-bred. Then he showed us his Heathkit
100 mc. and 6 cl. converter which is a 500
Command rx. We also saw a very nice valve
voltmeter, a Bendix frequency meter, and a
few other items of interest. We then adjourned
to inside where nips was provided by Mrs.
Rojet.

Keith also showed us his other hobby of
building up a 100 mc. set. He was very good
it was very good. We left at 11.15 p.m. after
a most enjoyable evening and thank-you to

NEWS AND NOTES

Don Granley won't be entering the R.D.
Contest but back him in the B.E.R.S. Contest
in January. He sat for his ticket and passed
grade 1 on 144 Mc.

GIROB on 20 metre s.a.b. wants reports. He
QSLs 100 per cent. Likewise 25MAIA on 80
Mc. and 25MAIA on 40 Mc. and 25MAIA on 20
Mc. Ian Thomas, over the last 12 months, has
heard only 418 VK stations. He says that after
all his figuring out, there are only one-sixth
of the stations in the band. He has com-
menced c.w. classes.

Well, fellows, I think I had better ring down
the curtain for this month. Hope to hear from
you all soon.

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Rise Time 0.028 microseconds or less.
Overheat 10° or less.

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Sensitivity 0.3 volt (r.m.s.) per inch at 1 Kc.
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Attenuator Low impedance type in cathode follower output.
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Federal Councillors:
 New South Wales—Bob Goddall, VK2ARG, Victoria—Alan Elliott, VK3AEI.
 Queensland—Arthur Wain, VK2AAW
 South Australia—Ivan Richards, VK3DQ
 Western Australia—Ron Hugo, VK6KW.
 Tasmania—E. J. Cruise, VK7EX.
Fed. News Editor: Quinn—Russ Coleman, VK2CKK.
Fed. Contest Committee: Alex Hubbard, VK7AX, Manager, Box 371B, Hobart, Tas.
QSL Bureau: R. E. Jones, VK3RJ, 33 Landale Street, Box Hill, E.I. Vic.
Awards Manager: A. C. Weynton, VK3XU, 5 York Street, Bondi Beach, N.S.W.

NEW SOUTH WALES

President: Dave Duff, VK2KRO.
Secretary: Norm Beard, VK2ALJ, Box 1734, G.P.O., Sydney.
Meeting Night: Fourth Friday of each month at Science House, Gloucester Street, Sydney.
QSL Bureau: Box 1734, G.P.O., Sydney. Frank Ilme, VK2QL, Manager; assisted by Allan Smith, VK2AIR.
Zone Correspondents: North Coast and Tablelands: Noel Hanson, VK2AHH, Ryan Ave., West Kempsey; Hunter Branch: R. W. Rose, VK2AGH, 11 Brook St., West Wauchope; Central Coast and Lakes: H. Hawkins, VK2YL, 6 Comfort Ave., Cessnock; Western: W. Bull, VK2VW, "Cannibowah," 100 South Coast Highway, E. Fisher, VK2DY, 5 Oxide St., Warrawong; Sth. Western: J. W. S. Edge, VK2AJO, Wallace St., Coolamon; Tamworth: S. Smith, VK2APB, 50 Upper St. S., Tamworth.

VICTORIA

President: D. A. Wardlaw, VK3ADW.
Secretary: J. R. Lancaster, VK3JL.

FEDERAL

W.I.A. REPRESENTATIVE TO GENOVA CONFERENCE LEAVES

John Moyle, VK4JU, W.I.A. representative with the Australian Government Delegation to the Extraordinary Radio Conference of the International Telecommunications Union, which commenced in Geneva on August 15, left Australia on Qantas Flight EM833 on Friday, 7th August.
 Passing through Melbourne en route, John was met by the Federal President, Max Hull (VK3ZB), and Vice-President, Bill Mitchell (VK3JL), when the plane landed at Essendon airport for an hour. John was in high spirits and hopeful for the future of Amateur Radio. His farewell message was taped for re-play over Divisional stations of the W.I.A.

MEMBERS OF DELEGATION TO THE GENOVA CONFERENCE

Herewith is the list of members of the Australian Delegation to Geneva.—
 E. J. Stewart, Supervising Engineer, Postmaster-General's Department—Leader.

CONTEST CALENDAR

Compiled by W.I.A. Fed. Contest Com.



SCANDINAVIAN ACTIVITY CONTEST:

Dates: C.W.—1500 GMT, Sept. 13, to 1800 GMT, Sept. 20, 1959.
 Phase—1500 GMT, Sept. 20, to 1800 GMT, Sept. 27, 1959.
 Entry: See August "A.R."
 Logs: Mailed not later than 13th Oct. 59 to Contest Manager, S.R.A.L., P.O. Box 306, Helsinki, Finland.

VK-ZL DX CONTEST, 1959:

Dates: Phase—1000 GMT, Saturday, 2nd Oct.—1000 GMT, 4th Oct.
 C.W.—10th Oct.—11th Oct., 1959.
 Entry: Overseas, on form 1857 VK-ZL.
 Bonus value altered (watch Aug. "A.R.").

"CQ" WORLD-WIDE:

Dates: Phase—Last week-end Oct. 59.
 C.W.—Last week-end Nov. 59.



Administrative Secretary: Mrs. May, 478 Victoria Parade, East Melbourne, C.I. Postal address: P.O. Box 30, East Melbourne, C.I.
Meeting Night: First Wednesday of each month at the Radio School, Royal Melbourne Technical College.

QSL Bureau: Inwards and Outwards—W.I.A., Vic Div., P.O. Box 36, East Melbourne, C.I.
Zone Correspondents: Victoria: W. J. Kinsella, VK3AKW, Magdala, Luback; South Western: W. Wines, 48 Cranley St., Warrnambool; Far North Western: M. Folke, VK3GZ, 101 Lemon Ave., Mildura; Midland: R. Jonsson, VK3ND, Farnsworth St., Castlemaine; North Eastern: T. K. Tennant, Park St., Tatura; Eastern: J. Spark, VK3AJK, 30 Marshall Ave., Bena.

QUEENSLAND

President: John Pickles, VK4PF.
Secretary: W. J. Rafter, VK4PR, Box 836, G.P.O., Brisbane.
Meeting Night: Fourth Friday in each month at the State Service Union Rooms, Elizabeth Street, Brisbane.
Divisional Sub-Editor: D. B. Hughes, VK4ZSD, 80 Mayne Rd., Bowen Hills, Brisbane.
QSL Bureau: Jack Film, VK4JF, Vanda St., Buranda.
Zone Correspondents: Maryborough: R. J. Glasco, VK4BG, 60 North St., Maryborough; Townsville: R. K. Wilson, VK4RW, Hogan St., Stuart, Townsville.

L. F. Pearson, Controller, Radio Branch, Postmaster-General's Department.
 L. J. Keith, Investigation Officer, Radio Branch, Postmaster-General's Department.
 J. B. Wigg, Radio Inspector, Radio Branch, Postmaster-General's Department.
 M. Stroblfeld, Divisional Engineer, Engineering Division, Postmaster-General's Department.
 R. Birt, Assistant General Manager, Overseas Telecommunications Commission.
 H. A. De Dassel, Technical Member, Commonwealth Telecommunications Board, London.
 W. Halford, Australian Broadcasting Control Board.
 E. Anderson, Department of Civil Aviation.
 L. K. Williams, Department of the Navy.
 Capt. J. Hanson, Department of Army Supply.
 Ldr. R. R. Clarke, Department of Air.
 J. M. Moyle, Wireless Institute of Australia Representative.

Representatives from the Department of External Affairs will also join the Delegation when it reaches Geneva.

ARMY CLUB PROPOSE AMATEUR STATION

From "Scan," the Southern Command Army Journal, of June 1959, is extracted the following:—
 "Plans are now being made to establish a licensed Amateur Radio Station at Puckapunyal which, members hope, will be on the air in the near future.

"The aim of the club is to foster Amateur Radio and act as a medium to train members to the standard necessary to obtain a P.M.G. Certificate of Proficiency.
 "This will enable them to obtain a licence to operate their own stations.
 "The club has the interest and patronage of Brigadier G. P. Hunt, Area Commander, who was an active Ham for some years, and will be fostered by Capt. V. A. E. Crawford.
 "The Club has his own equipment to operate on the 80 and 144 megacycle Amateur band.

"Postal Department permission has been granted to Sgt. R. E. Walker, of 1 C.O.D., Bandiana, to operate an Amateur Radio Station. He has been allotted the call sign VK3UW.
 "Walker has been an interested in Amateur Radio for some years and has built several receiving and transmitting sets."

FED. CONTEST COMMITTEE

Members of the Federal Contest Committee now comprise: Messrs. R. D. O'May, TOM; L.

SOUTH AUSTRALIA

President: B. W. Austin, VK3CA.
Secretary: J. C. Haseldine, VK3JC, Box 1284K, G.P.O., Adelaide. Telephone: M 7551.
Meeting Night: Second Tuesday of each month at 17 Wymouth St. Adelaide.
Divisional Sub-Editor: W. Parsons, VK3PB, 19 Victoria Ave., Ruse Park.
QSL Bureau: G. Luxton, VK3KH, 27 Belair Rd., West Mitcham, S.A. (Inwards & Outwards).

WESTERN AUSTRALIA

President: L. Rosser, VK3H.
Secretary: J. R. Rims, VK3BE, Box N102, G.P.O., Perth, W.A.
Meeting Night: Third Tuesday of month at Perth Tech. College Annex, Mounts Bay Rd. Divisional Sub-Editor: J. B. Elms, VK3B9, 29 Central Road, Kalamunda.
QSL Bureau: Jim Rumble, VK6RU, Box F112, G.P.O., Perth, W.A. (Inwards and Outwards).

TASMANIA

President: M. L. E. Jensen, VK7LJ.
Secretary: K. E. Millin, VK7KA, Box 371B, G.P.O., Hobart.
Meeting Night: First Wednesday of each month at W.I.A. Clubroom, 147 Liverpool St. Hobart.
Divisional Sub-Editor: I. Nichols, VK7ZZ, 9 Cressy St., New Town.
QSL Bureau: Balcer, VK7BE, 88 Willoughden Ave., Lower Sandy Bay, Hobart.
Zone Correspondent: North Western Zone—F. Long, VK7TT, Northern Zone—Ray Walden.

PAPUA-NEW GUINEA

President: F. N. Nolan, VK4FN.
Secretary: Ray Taylor, VK4AP, P.O. Box 204, Port Moresby.
Meeting Night: Last Wednesday in each month. R.S.L. Reading Rooms, Elia Beach, Port Moresby.
QSL Bureau: G. Kiernan, VK3KG, P.O. Box 204, Port Moresby.

R. Jensen, TLJ; F. E. Nichols, IRY; J. C. Batchler, TJB; A. Hubbard, TAX. After a lengthy discussion regarding their duties, at the first meeting of the Committee, it was finally decided on the following allocations on a possibly temporary basis, until such time as the work involved in contests was clarified by experience:—

Mr. A. Hubbard to be general manager and chairman.
 Mr. F. E. Nichols to be secretary and treasurer.
 Mr. J. C. Batchler to be sub-manager of VK-ZL Contest and publicity.
 Mr. R. D. O'May to be sub-manager of Ross Hull and N.P.D. Contests.
 Mr. L. R. Jensen to be sub-manager of R.D. Contest.

In addition, TCH, TDW, TZZ, TAL, TKS and TNS are to be ex-officio members of the Committee.

FEDERAL QSL BUREAU

A new Award styled Port Wine Award, established by the Port Wine Institute in Australia and the Port Wine Club in New Zealand, is designed to "foster the world-wide renown of Port Wine." Details may be had from this Bureau.

An expedition to find signing EASIA was scheduled to be active during July. For those who missed out it, it is stated that a regular station in the same location will be active from August onwards.

Alan VK3MHL, on the homeward leg of a world tour, and accompanied by his XYL, was the guest of Al Scarlett, WEGC, for nine days in July. Al's car did not have an opportunity to get back to normal, because within a few days of Alan's departure, Jack Elliott, ZJ3CC, dropped in for a fortnight's stay. Al and Jack propose touring the Lakes region early in August and on return home, Jack will proceed south to be the guest of WSAHV who

SILENT KEY

It is with deep regret that we record the passing of:—

VK2AYE—D. E. Evans.
 VK3OS—R. O. Scott.

—Ray Jones, VKIRJ, Manager.

A tribute was paid to the work which Joe ZJR has done for the Division over the years, possibly all now know that Joe has, under medical advice, been forced by his state of health to relinquish his Amateur activities completely for at least six months. He, latterly, has been responsible for the tape recording of lectures and other material which will be going into the country tube and members of it need without saying that with Joe a speedy recovery to robust health.

The President then asked John ZJU, our accredited representative to Geneva, to make

42 Frederick St., Narrandera, N.S.W.

★

3-4 p.m.: 144 Mc. Hidden Tx Hunt.
4.30 p.m.: Prizegiving, Farewells, etc.
Usual races and competitions for XYLs
and Harmonica.
Boiling water will be available free.

I met him first in 1956 and during the limited periods the band was open had approx 150 QSOs with him at 1700 hours EAST, and I am sure that the many who knew him will miss his jovial personality in the air. The USM fraternity will be the poorer for his passing, and as a member of the VKs in General I offer this tribute to his memory and offer condolences to his XLV and family.—Alf Brown, VK5QW.

and members adjourned for the usual recess.

We urge you to tonic, tonic, tonic, tonic; We wish to meet you all and would like you to serve on the interesting lectures provided each month. For the convenience of new and country members, there are two members of Council who are ready to greet you, to look after you and help you find the chaps you wish to meet, so fellows roll up to the next meeting at Science House, Gloucester Street, Sydney, on the fourth Friday of the month—August 28. See you there.

Nice to be able to listen to 2AWX on Monday nights now that Lionel hurries over his evening meal and pulls the big switch on at 1000 hours, an hour earlier. At this time your official Branch station is being heard in VRland at strength 9 and some of the gang over there hope to be in future call-backs. Meandering along Bull Street the other day noticed a

September monthly meeting will be at the usual place, Tighes Hill, University of N.S.W., on 11th. Weather should be better so there will be no excuse for non-attendance. P.S.—Even though the I.T.U. Fund is closed, I'm sure post donations will be accepted.

Joe Bramall, VK4JEB, has returned to Honiara in the British Solomon Islands. Whilst in Melbourne with his wife, Joe made the acquaintance of many of the VK3 Amateurs and also several members of the Victorian Division of the W.I.A. Whilst here in Melbourne, Mr. Bramall continued business with the pleasure of seeing her family in Frankston, and presented Joe with a very fine 84 lb. harmonic, Hugh Ashton. An exceedingly clever arrangement as baby arrived on Joe's birthday and was named after the anniversary. No doubt VK4JEB will be on the lookout for contacts with his VK friends.

Wind and rain, rain and dust, combinations of all, antennae windmilling like helicopter blades making signal meters dance, so has been the conditions here this week. The junior zone correspondent reports that t.v. antennae in Shepparton were snapped off half

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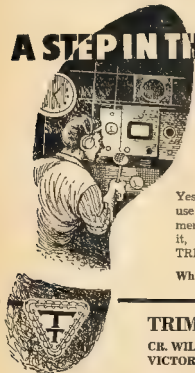
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THE PILOT can be purchased on a low deposit and very easy monthly repayments. PILOT manufacturers of Hi-Fi Amplifiers for 23 years.

Specifications: Model HFA 13 Power Amplifier.

Power Output: 12 watts.

Frequency Response: Plus or minus 1 db 15-50,000 c.p.s.

Sensitivity: 200 mV. for full output.

Total Harmonic Distortion: 0.1 per cent. for 8 watts at 1 Kc/s.

Hum Level: 20 db below full output.

Negative Feedback: 20 db.

Speaker Output Impedance: 3, 8 and 15 ohms; simple change-over points.

Damping Factor: 25.

Main Power: 110/220-250v. a.c. 40-100 c.p.s.

Valve Line-up: EF85, ECC82, EL84 (2), 6Z4.

A.c. power outlet provided controlled by ON/OFF switch.

Case: In Pale Gold finish, attractively styled.

All functions clearly marked.

Dimensions: 11½ in. wide x 8½ in. high

x 6-13/16 in.

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4C	£1/11/0	3K	£2/12/0
4F	£2/0/0	3M-PA	£2/10/0
5-4C	£1/17/0	3M	£2/10/0
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5C	£1/13/0	10-3G	£2/15/0
5F	£3/7/0	12K	£2/5/0
5FX	£2/5/0	ETM	£2/1/0
7-3L	£2/3/0	12MX	£2/10/0
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H4 (Record-Play) and EH4 (Erase) Minire	

Note: "E" denotes upper half track, half track, all others full track; EH4, which are half track, see for booklet, "MAGNET" containing full details, heads, hi-fi circuits, etc. every head.

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